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Huddleston

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(54) **TRAILER LATCH FOR BOAT MOTOR SUPPORT**

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B62D 63/08 (2006.01)

(52) **U.S. Cl.**
CPC ***B60P 3/1066*** (2013.01); ***B60P 3/10*** (2013.01); ***B60P 3/1033*** (2013.01); ***B62D 63/08*** (2013.01)

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USPC 410/121–124, 149–151; 440/53, 55, 63, 440/113; 248/351, 354.3, 354.5, 354.6, 248/640–643; 280/414.1; 114/55.52
See application file for complete search history.

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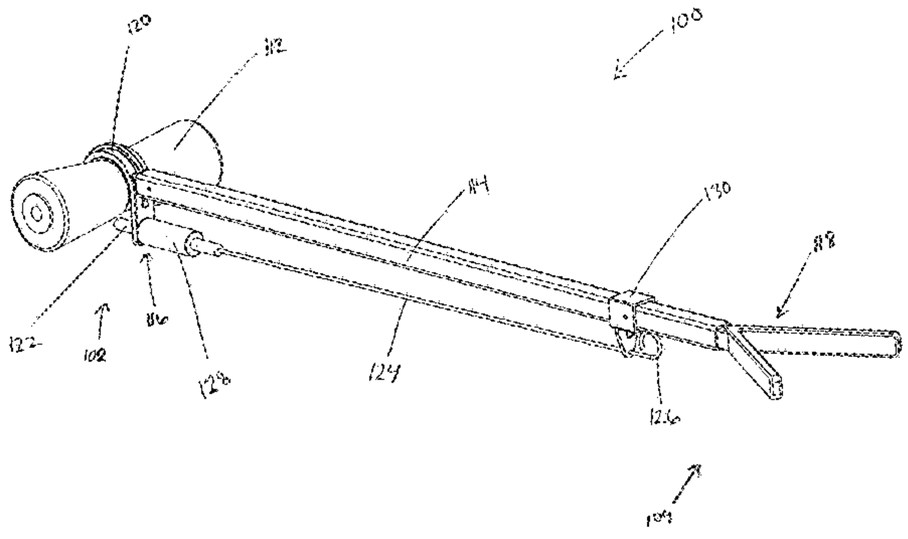
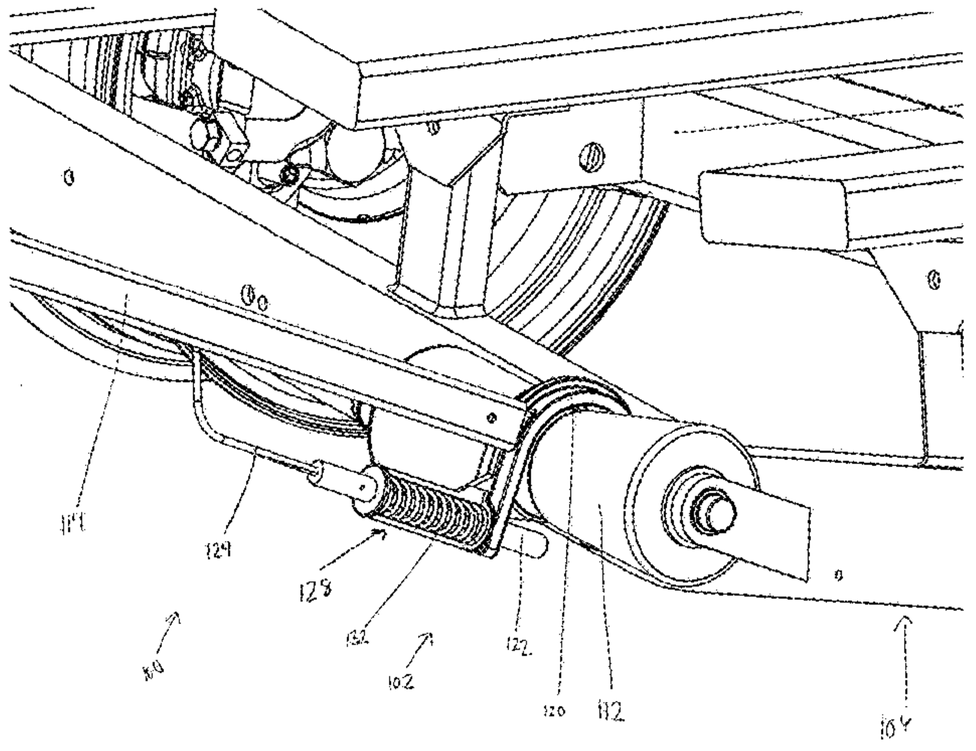
(57) **ABSTRACT**

A system for supporting a motor of a boat with respect to a boat trailer is provided. The system includes a longitudinally extendable support shaft that is configured to be secured in a selected one of a plurality of extended positions, a motor support disposed at a first end of the support shaft; and a boat trailer connector disposed at a second end of the support shaft. The trailer connector includes a releasable latch to connect the trailer connector to the boat trailer. The trailer connector includes a manually enagageable actuator configured to selectively latch or release the trailer connector from the boat trailer.

10 Claims, 10 Drawing Sheets





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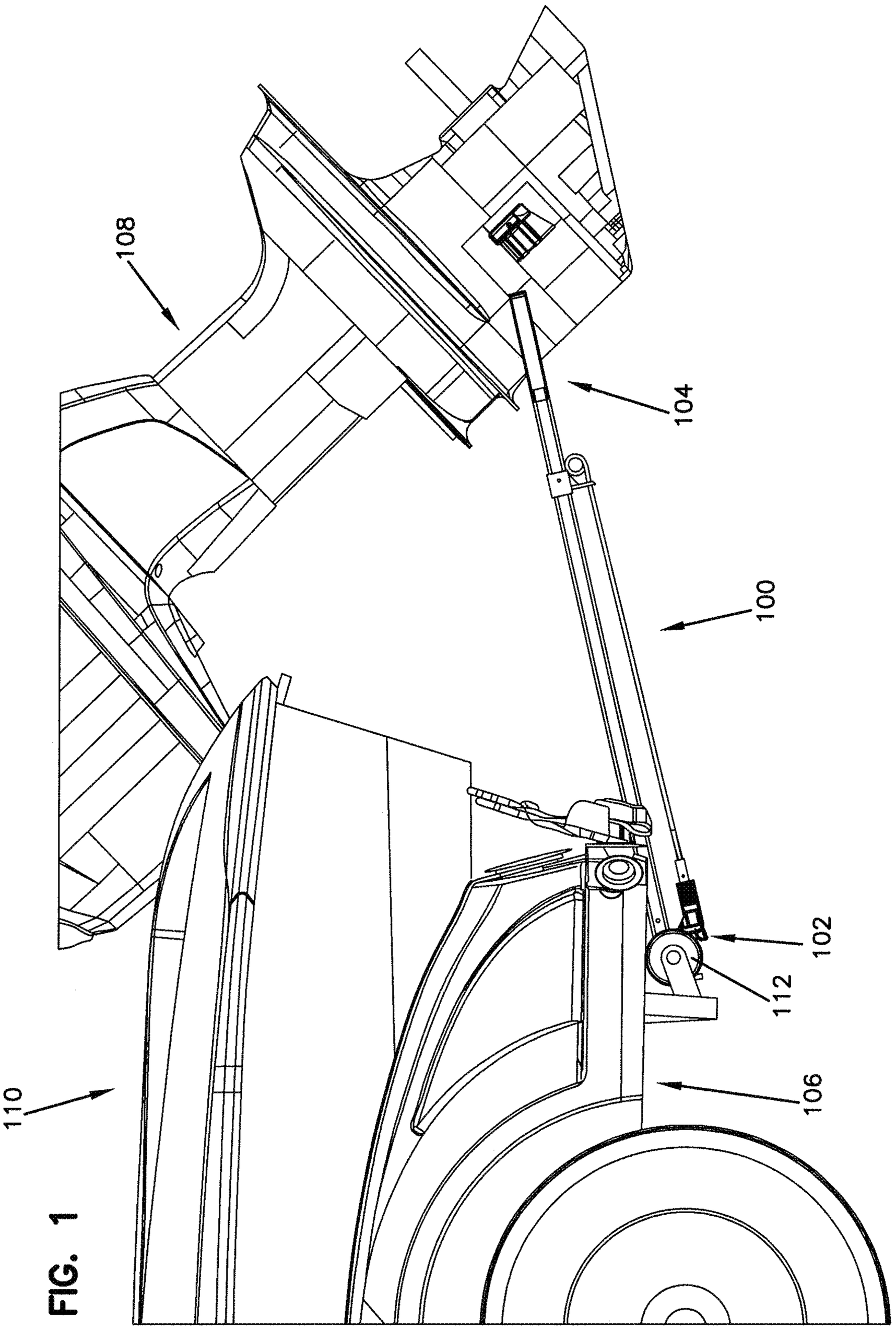

FIG. 1

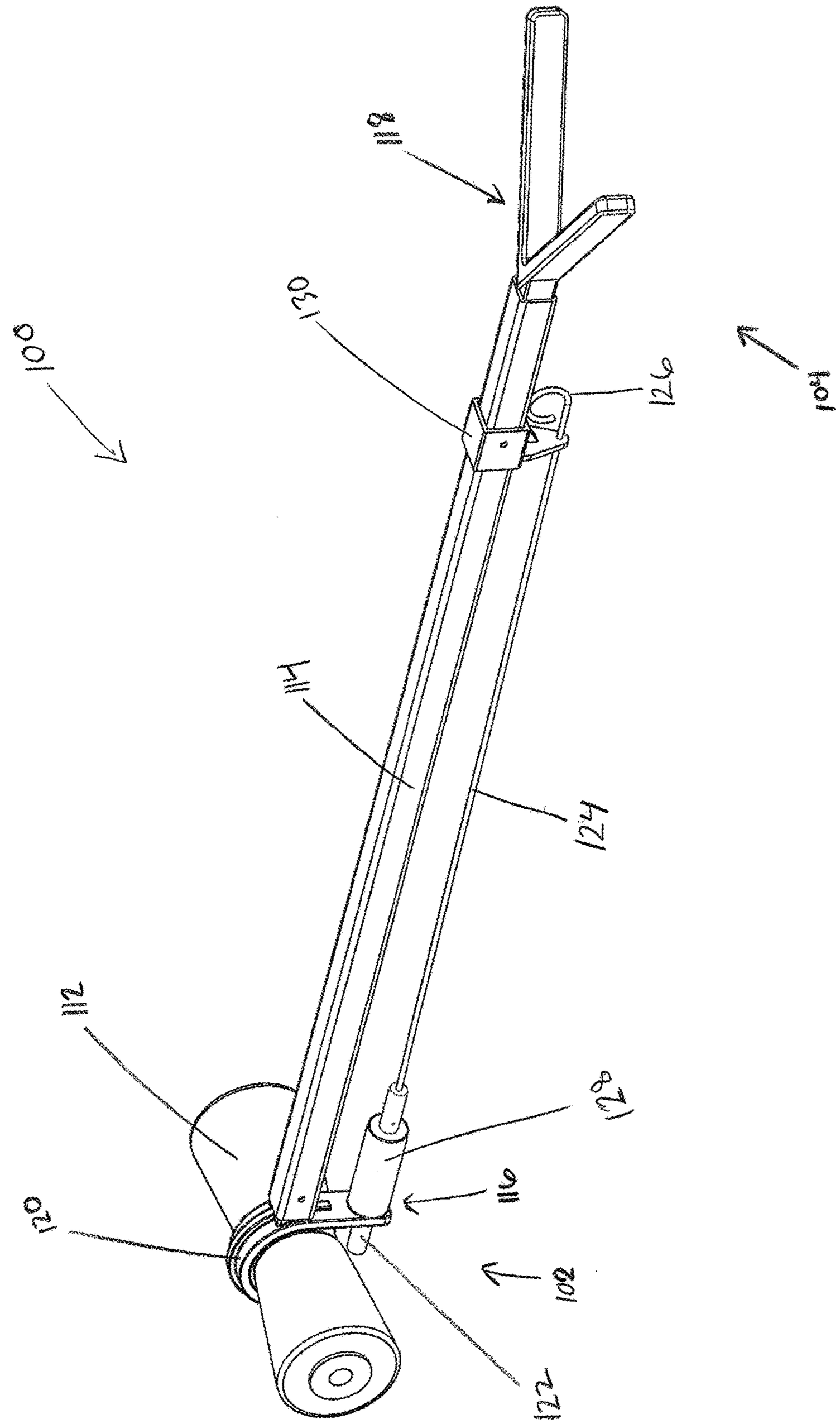

FIG. 2

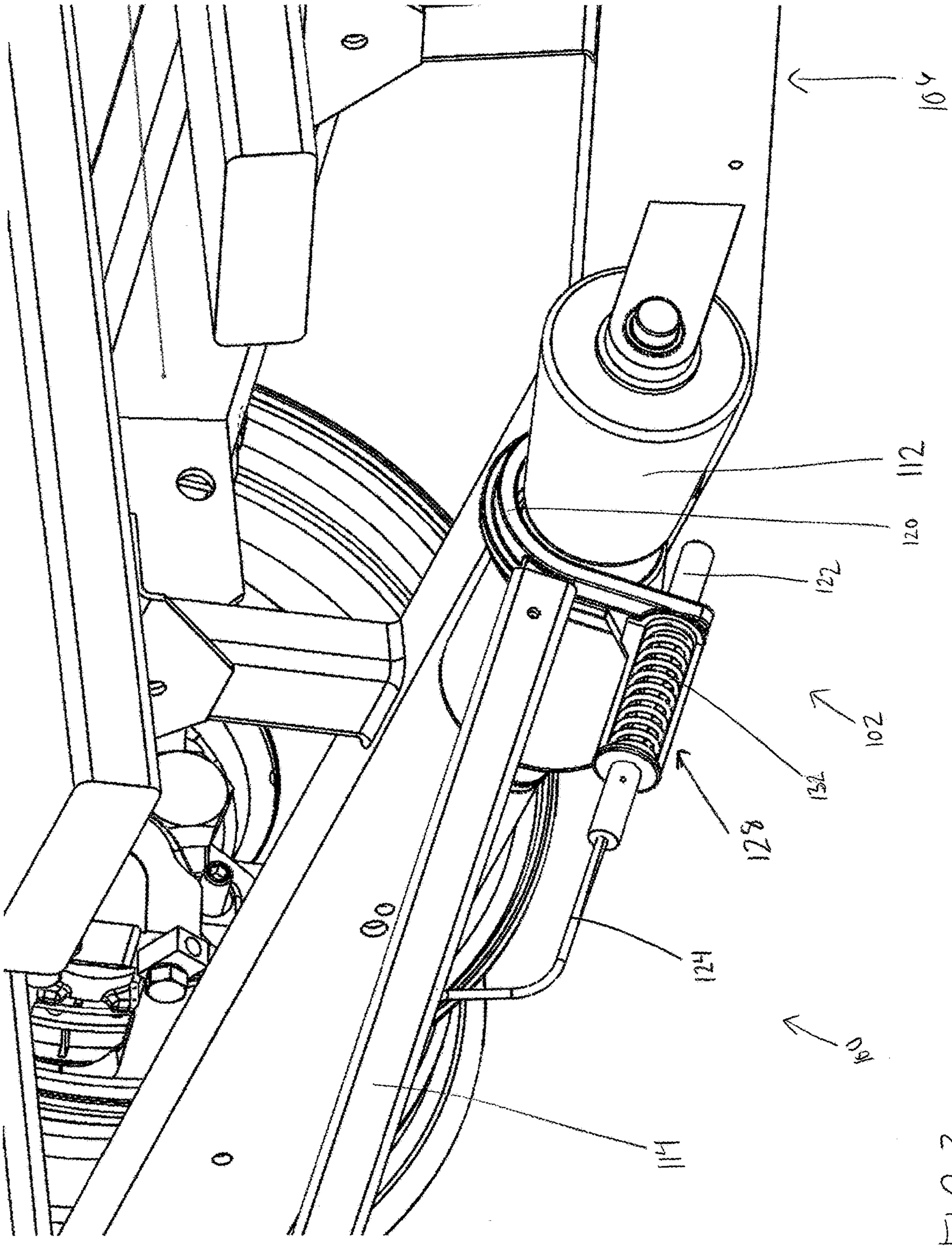

FIG. 3

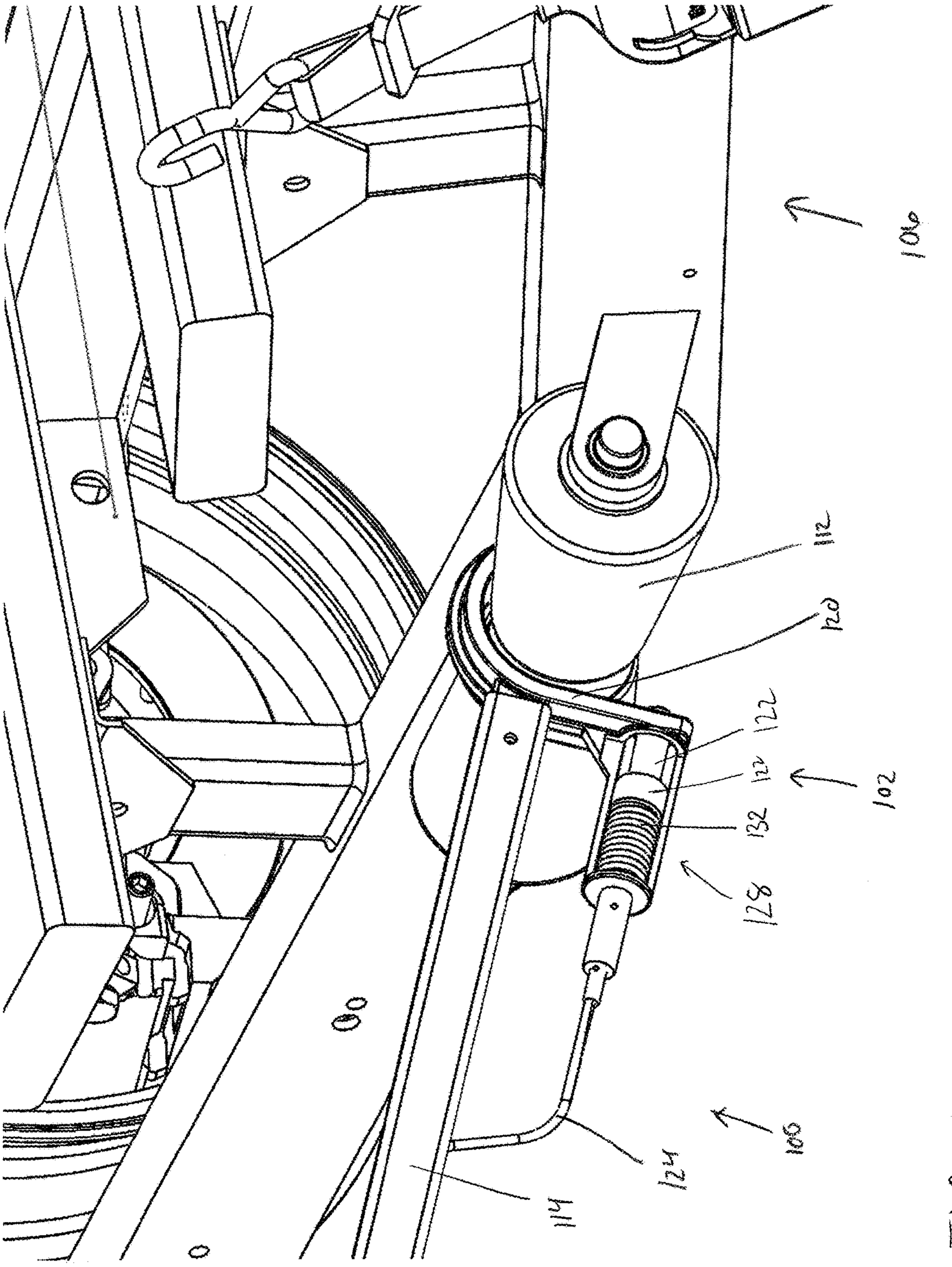

FIG. 4

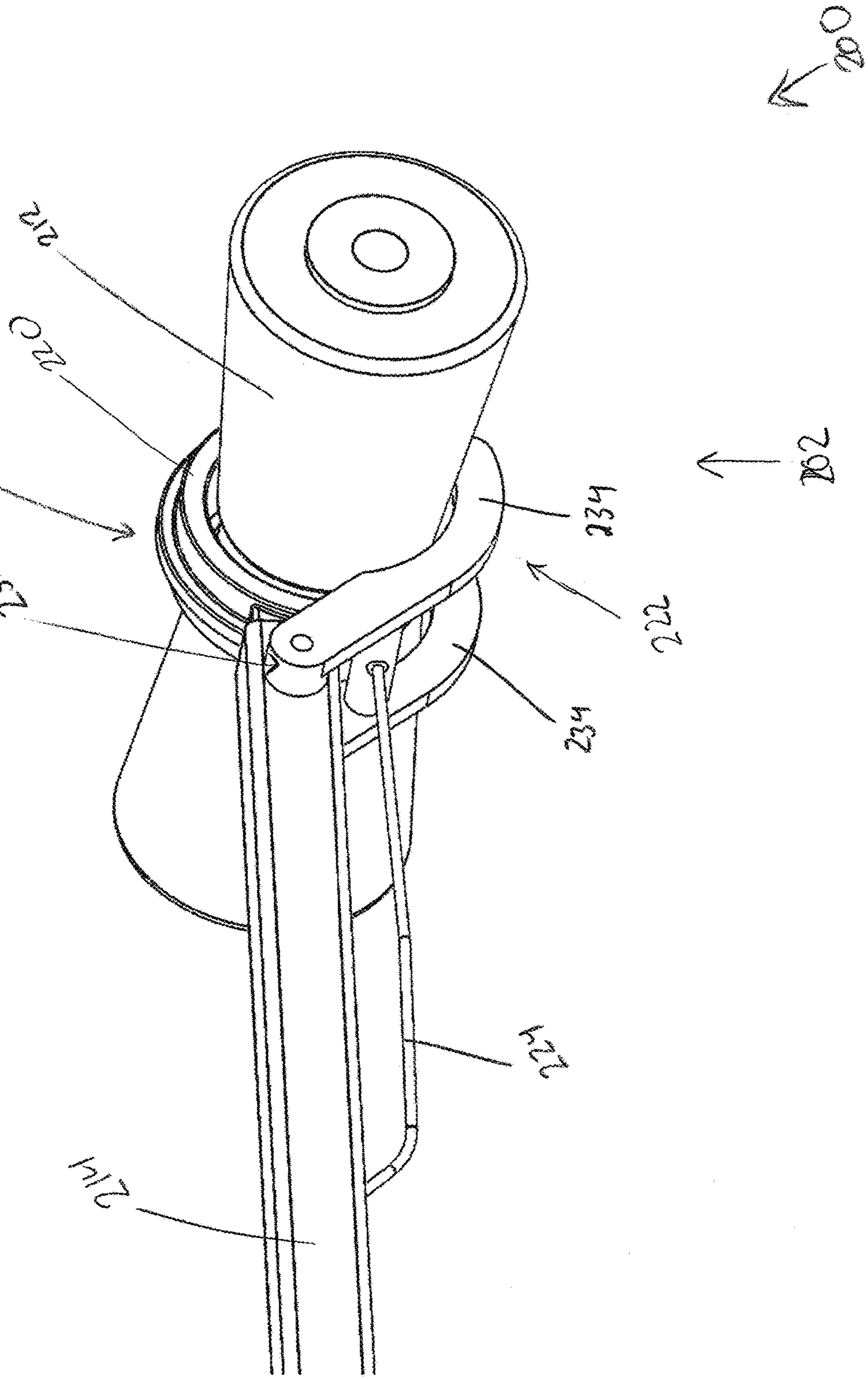

FIG. 5

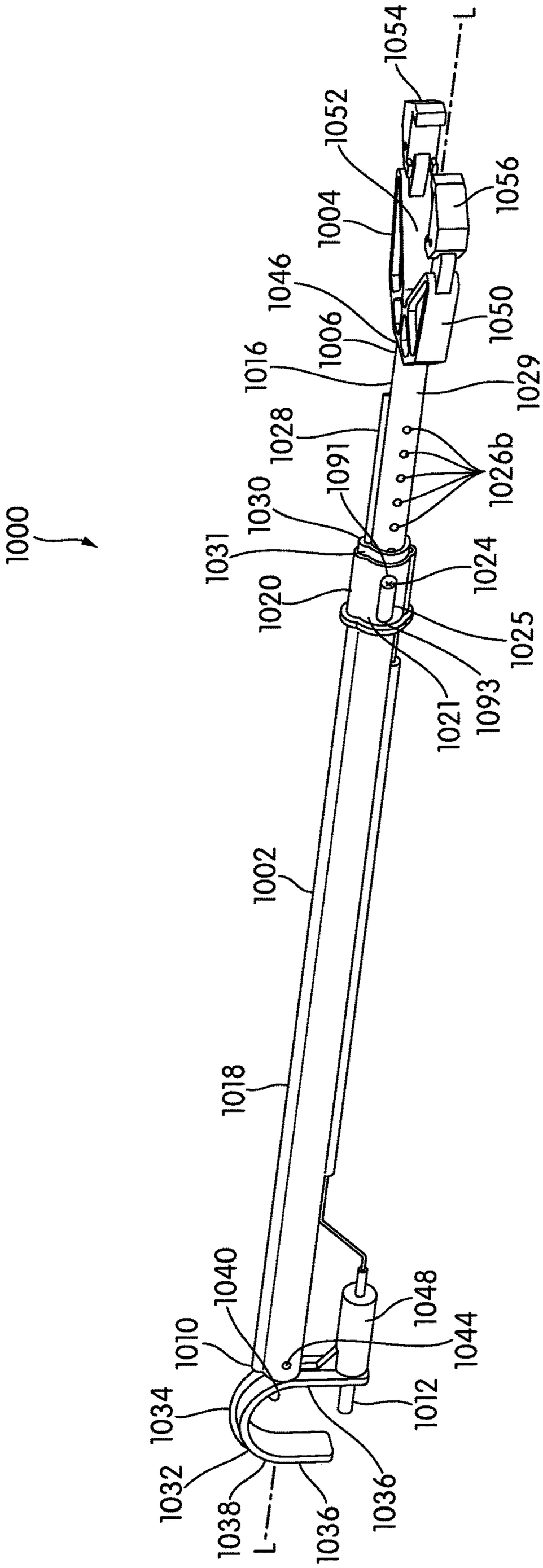
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FIG. 6

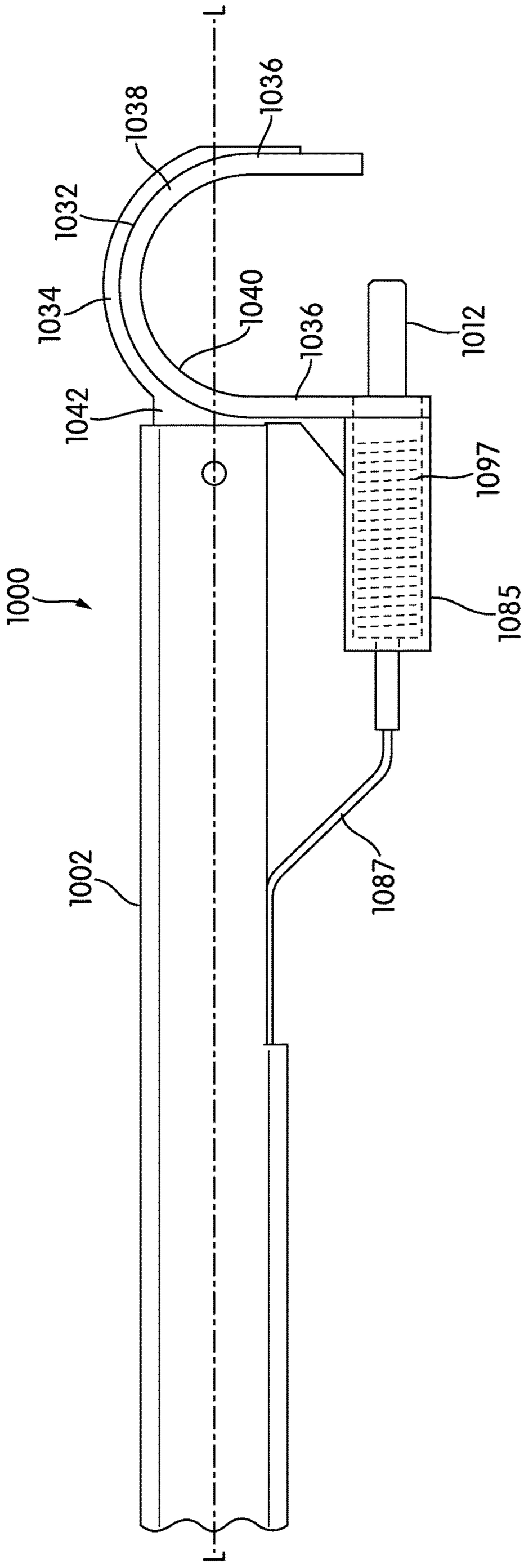
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FIG. 7

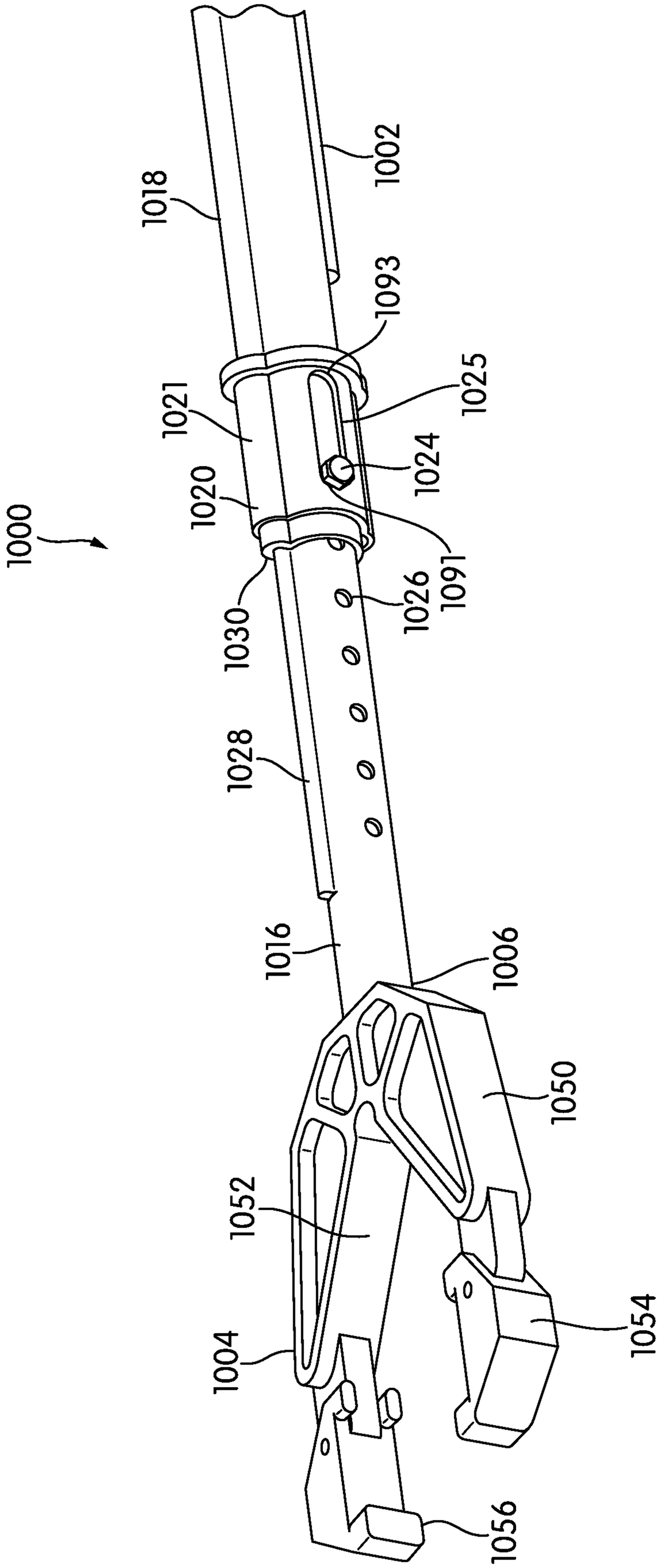
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FIG. 8

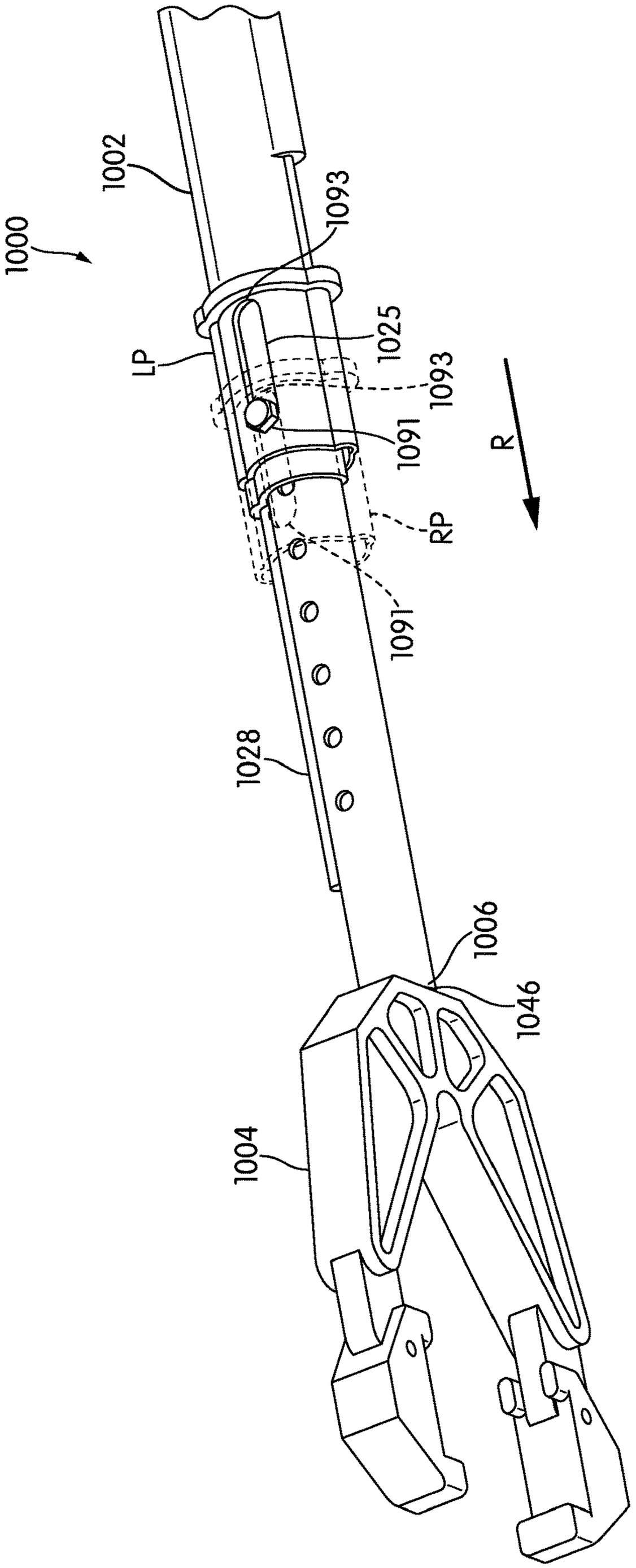

FIG. 9

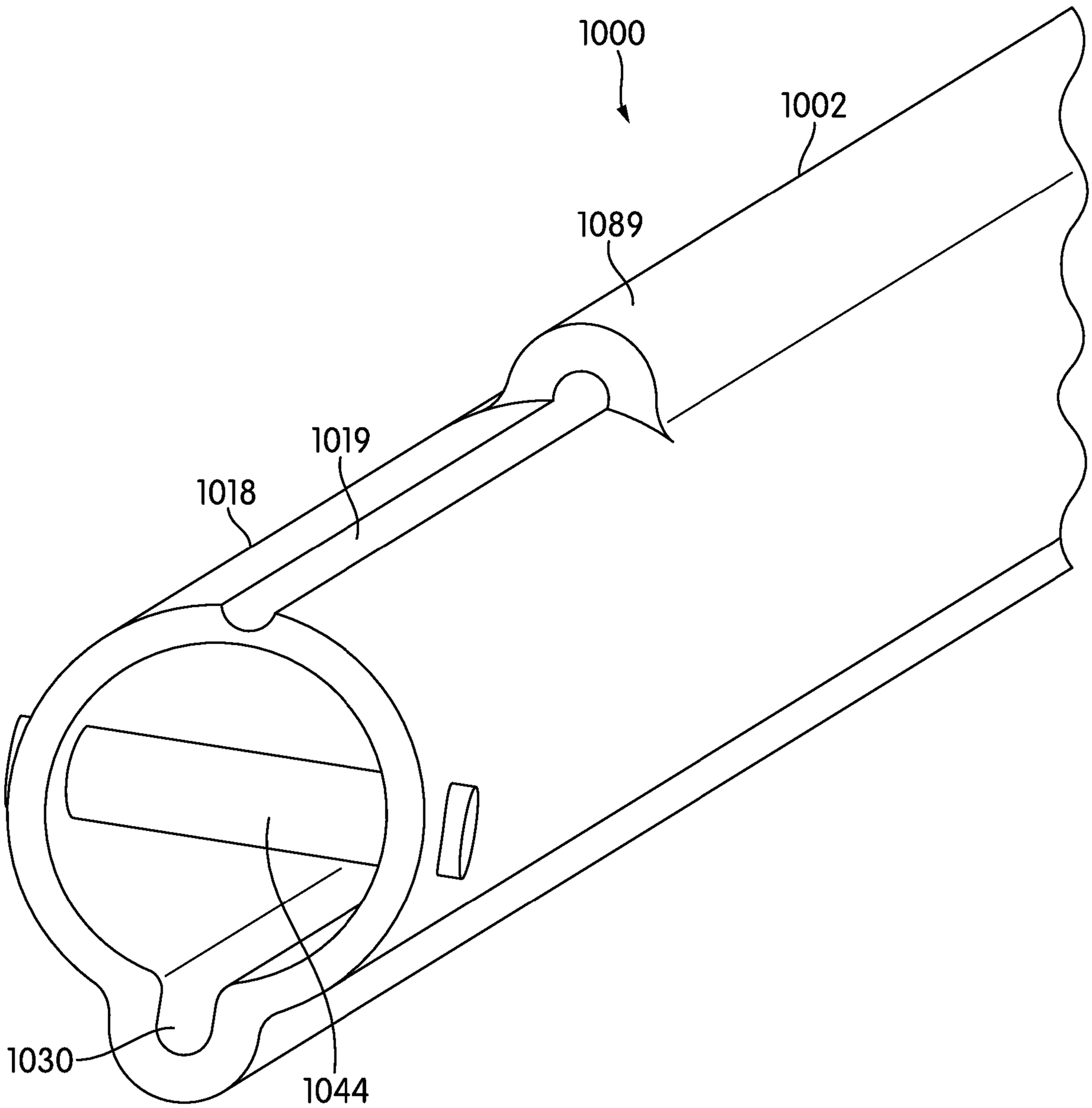

FIG. 10

TRAILER LATCH FOR BOAT MOTOR SUPPORT

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims priority to U.S. Provisional Application No. 62/146,016, filed Apr. 10, 2015, which is hereby incorporated by reference in its entirety.

FIELD

The present patent application relates to a system for supporting a motor of a boat with respect to a boat trailer.

BACKGROUND

When transporting a boat on a trailer, a motor of the boat is supported in a fixed position to limit the amount of vibrational stress a bouncing motor can put on the transom of the boat. Some boats may include built-in mechanisms to support the motors while others do not. However, even the built-in support mechanisms on some boats still are prone to disengaging when rough road surfaces are encountered.

In some instances, a separate motor support mechanism may be used to support the motor in a fixed, elevated fashion, as a standalone motor support. However, just like some built-in support mechanisms, some separate support mechanisms are prone to being jarred loose, leading to possible damage to the motor, boat trailer, or motor support mechanism itself. Further, attaching a separate support mechanism can be a cumbersome process, causing some users to forego use of a separate support mechanism entirely. Therefore, improvements in the design of, and the method of attaching, a motor support mechanism are needed.

SUMMARY

One embodiment of the present patent application provides a system for supporting a motor of a boat with respect a boat trailer. The system includes a support member having a first end portion constructed and arranged to support the motor of the boat and a second end portion constructed and arranged to be releasably secured to a portion of the boat trailer; a generally inverted U-shaped member constructed and arranged to receive the portion of the boat trailer within the generally U-shaped configuration. The U-shaped member has a bight portion and a pair of leg members extending downwardly from the sides of the bight portion. The support member is constructed and arranged to be connected to one of the pair of leg members of the U-shaped member. The system also includes a releasable latch assembly constructed and arranged to releasably secure the inverted U-shaped member to the portion of the boat trailer. The latch assembly includes a latch member moveable between a latched position and a released position. In the latched position, the latch member is constructed and arranged to retain the portion of the boat trailer within the generally U-shaped configuration of the U-shaped member.

Another embodiment of the present patent application provides a system for supporting a motor of a boat with respect a boat trailer. The system includes a first support member constructed and arranged to support the motor of the boat, and a second support member constructed and arranged to be releasably secured to a portion of the boat trailer. The first support member is constructed and arranged to be received by and extending in and out of the second support member to facilitate longitudinal telescopic movement between first and second support members. The system includes a lock assembly constructed and arranged to selectively lock the first and second support members at one of a plurality of longitudinally extended positions. The lock assembly includes a lock member that is movable between a first position and a second position. The lock member is linked to lock components associated with the first and second support members so that the movement of the lock member from the first position to the second position unlocks the lock assembly to enable the longitudinal telescopic movement between first and second support members.

Yet another embodiment of the present patent application provides a system for supporting a motor of a boat with respect to a boat trailer. The system comprises a longitudinally extendable support shaft that is configured to be secured in a selected one of a plurality of extended positions; a motor support disposed at a first end of the support shaft; and a trailer connector disposed at a second end of the support shaft. The trailer connector comprises a releasable latch to connect the trailer connector to the boat trailer. The trailer connector comprises a manually engageable actuator configured to selectively latch or release the trailer connector from the boat trailer.

The present disclosure relates generally to motor support for a boat trailer. In one embodiment, and by non-limiting example, the motor support includes a latching mechanism.

In one embodiment of the present disclosure, a motor support for a boat trailer is disclosed. The motor support includes a support shaft configured to support, in a spaced-apart relationship, a motor of a boat with respect to the boat trailer. The motor support also includes a trailer end and a motor end. The trailer end defines a spring-loaded latching mechanism configured for latching the trailer end of the motor support with respect to a portion of the boat trailer.

In another embodiment of the present disclosure a motor support for a boat trailer is disclosed. The motor support includes a support shaft configured to support, in a spaced-apart relationship, a motor of a boat with respect to the boat trailer. The motor support also includes a trailer end. The trailer end defines a spring-loaded latching mechanism configured for latching the trailer end of the motor support with respect to a portion of the boat trailer. The latching mechanism defines a pull handle operable against a bias of the spring for releasing the trailer end of the motor support from the boat trailer. The motor support also includes a motor end. The motor end includes a motor support structure configured to rest against a portion of a motor of a boat.

In another embodiment of the present disclosure, a method of attaching a motor support to a boat trailer is disclosed. The method includes opening a spring-loaded latching mechanism. The method also includes coupling the latching mechanism to the boat trailer and allowing the latching mechanism to close under a spring bias.

In yet another embodiment of the present disclosure, a method of attaching a motor support to a boat trailer is disclosed. The method includes opening a spring-loaded latching mechanism that is at a first end of a motor support. The method also includes positioning the spring-loaded latching mechanism around a keel roller of a boat trailer. The method also includes coupling the latching mechanism to the keel roller of the boat trailer by allowing the latching mechanism to close under a spring bias. The method also includes supporting a motor of the boat by positioning a motor support structure against the motor. The motor support structure is at a second end of the motor support.

According to another embodiment of the present disclosure, a motor support for a boat trailer is disclosed. The motor support includes a support shaft configured to support, in a spaced-apart relationship, a motor of a boat with respect to the boat trailer. The motor support also includes a trailer end and a motor end. The trailer end defines a latching mechanism configured for latching the trailer end of the motor support with respect to a portion of the boat trailer. The latching mechanism includes an engagement portion and a retention portion. The retention portion is movable with respect to the engagement portion.

These and other aspects of the present patent application, as well as the methods of operation and functions of the related elements of structure and the combination of parts and economies of manufacture, will become more apparent upon consideration of the following description and the appended claims with reference to the accompanying drawings, all of which form a part of this specification, wherein like reference numerals designate corresponding parts in the various figures. In one embodiment of the present patent application, the structural components illustrated herein are drawn to scale. It is to be expressly understood, however, that the drawings are for the purpose of illustration and description only and are not intended as a definition of the limits of the present patent application. It shall also be appreciated that the features of one embodiment disclosed herein can be used in other embodiments disclosed herein. As used in the specification and in the claims, the singular form of "a", "an", and "the" include plural referents unless the context clearly dictates otherwise. As used herein, the term "may" as used in connection with any structural or functional attributes, will in some embodiments have those attributes, but that such structural or functional attributes are not required in all embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** illustrates a schematic side view of a motor support disposed between a boat trailer and a boat motor, according to one embodiment of the present disclosure;

FIG. **2** illustrates a perspective view of the motor support shown in FIG. **1**;

FIG. **3** illustrates a schematic side view of a portion of a motor support similar to that of FIG. **1**, shown in a closed position, portions of the motor support are cut-way to show the internal features thereof;

FIG. **4** illustrates a schematic side view of a portion of the motor support of FIG. **3**, shown in an open position;

FIG. **5** illustrates a perspective view of a motor support, according to another embodiment of the present disclosure;

FIG. **6** shows a perspective view of a system for supporting a motor of a boat with respect a boat trailer in accordance with another embodiment of the present patent application;

FIG. **7** shows a partial, front elevational view of the system in accordance with an embodiment of the present patent application;

FIG. **8** shows a partial, perspective view of the system in accordance with an embodiment of the present patent application;

FIG. **9** shows another partial perspective view of the system in accordance with an embodiment of the present patent application; and

FIG. **10** shows a partial perspective view of a second support member of the system in accordance with an embodiment of the present patent application.

DETAILED DESCRIPTION OF THE DRAWINGS

Various embodiments will be described in detail, by way of example only, with reference to the accompanying schematic drawings, wherein corresponding reference symbols indicate corresponding parts and like reference numerals represent like parts and assemblies throughout the several views. Reference to various embodiments does not limit the scope of the claims attached hereto. Additionally, any examples set forth in this specification are not intended to be limiting and merely set forth some of the many possible embodiments for the appended claims.

FIG. **1** depicts a motor support **100** in accordance with one embodiment of the present patent application. The motor support **100** includes a trailer end **102** and a motor end **104**. In one embodiment, the motor support **100** is positioned between a boat trailer **106** and a motor **108** of a boat **110**. The motor support **100** is configured to hold the motor **108** of the boat **110** in a fixed, elevated position so that the lowest point of the motor **108** (i.e., the propeller (not shown)) is elevated from the ground. The trailer end **102** is in contact with the boat trailer **106**, and the motor end **104** is in contact with the motor **108**. In one embodiment, the trailer end **102** is latched to the boat trailer **106**, for example, to a keel roller **112** of the boat trailer **106**.

FIG. **2** shows a perspective isometric view of the motor support **100**. The motor support **100** includes a support shaft **114**, a latching mechanism **116**, and a motor support surface **118**. As shown, the motor support **100** is constructed and arranged to be attached to the keel roller **112**. In one embodiment, the keel roller **112** may be a part of the boat trailer **106** shown in FIG. **1**.

The support shaft **114** is disposed between the trailer end **102** and the motor end **104**. In one embodiment, the support shaft **114** may generally be hollow. In another embodiment, the support shaft **114** may generally be solid. Further, in other embodiments, the support shaft **114** may be configured to be length-adjustable.

The latching mechanism **116** is configured to secure the motor support **100** to a portion of the boat **110** (as shown in FIG. **1**). In one embodiment, the latching mechanism **116** is configured to be attached to the keel roller **112** of the boat trailer **106**.

The latching mechanism **116** includes an engagement portion or element **120** and a retention portion or element **122**.

The engagement element **120** is configured to engage a portion of the boat trailer **106** so as to removably secure the motor support **100** to the boat trailer **106**. In one embodiment, the engagement element **120** is an arm. In one embodiment, the engagement element **120** may be generally curved (i.e., hooked), and is configured to partially surround an upper portion of the keel roller **112**. The engagement element **120** is configured to latch onto the keel roller **112** of the boat trailer **106** to prevent the motor support **100** from disengaging in the horizontal direction.

The retention element **122** is configured to retain the engagement element **120** on the boat trailer **106**, for example, to the keel roller **112** of the boat trailer **106**. The retention element **122** has two positions: a closed position and an open position. In the closed position, the retention element **122** aids in maintaining the latching of the latching mechanism **116** to the boat trailer **106**, for example, to the keel roller **112** of the boat trailer **106** and limits removal of the latching mechanism **116** from the keel roller **112** of the boat trailer **106**. In the open position, the retention element **122** allows for removal of the latching mechanism **116** from the keel roller **112** of the boat trailer **106**. In one embodiment, the retention element **122** is a pin.

In one embodiment, the retention element **122**, shown as a pin, is movable between the closed position and the open

position by way of an attached rod **124** with a pull handle **126**. To move the retention element **122** to the open position, the user of the motor support **100** pulls the pull handle **126** of the rod **124** in a direction toward the motor end **104**. To move the retention element **122** to the closed position, the rod **124** is moved in a direction toward the trailer end **102**. As shown, the rod **124** and the retention element **122** are generally parallel to the support shaft **114**. In one embodiment, the rod **124** may be placed at least partially, or completely, within the support shaft **114**. The rod **124** is partially contained within a latching cylinder **128** at the trailer end **102** of the motor support **100** and is supported at the motor end **104** of the motor support **100** by way of a rod hanger **130**. In one embodiment, the latching cylinder **128** also houses an internal spring that is configured to spring load the rod **124** and the latching mechanism **116** (described in detail in FIGS. **3** and **4**).

The rod **124** is configured to be a length that is similar to the length of the support shaft **114**. The pull handle **126** of the rod **124** is positioned near the motor end **104** to ensure ease of access by the user during operation of the motor support **100**.

FIG. **3** shows a side perspective view of a portion of a motor support **100'** attached to the keel roller **112** of the boat trailer **106**. In one embodiment, the rod **124** is partially housed within the support shaft **114**. The retention element **122** is shown in the closed position, and a partial cutaway view of the latching cylinder **128** is shown.

In one embodiment, the latching cylinder **128** encases a spring **132**. The rod **124** enters at one side of the latching cylinder **128** and is attached to the retention element **122** at the opposite side of the latching cylinder **128**. Within the latching cylinder **128**, the spring **132** is coiled around the rod **124** and biased against the latching cylinder **128** at one end and against the retention element **122** at the other end. In its resting state, and when the rod **124** is not operated by a user, the spring **132** keeps the retention element **122** in the closed position.

FIG. **4** shows the retention element **122** in the open position. Accordingly, the rod **124** is shown in a retracted state, and the spring **132** is shown in a compressed state. In one embodiment, the spring force of the spring **132** may be a value that can be overcome by a human hand pull and strong enough to force the retention element **122** back to the closed position when the rod **124** is released by the user.

FIG. **5** shows a portion of a motor support **200** according to another embodiment of the present disclosure. The motor support **200** includes a trailer end **202**, a latching mechanism **216**, a support shaft **214**, and a pull rod **224**. The motor support **200** shares similar elements with the motor support **100** and **100'** as described above.

The latching mechanism **216** of the motor support **200** includes an engagement element **220** and a retention element **222**. In one embodiment, the engagement element **220** includes a first arm **220**. In one embodiment, the first arm **220** is a curved arm that is configured to partially surround the upper portion of a keel roller **212**.

Also, in one embodiment, the retention element **222** includes a second arm **222**. In one embodiment, the second arm **222** is a curved arm that is configured to partially surround the lower portion of the keel roller **212**. Additionally, the second arm **222** is pivotable with respect to the first arm **220**. In one embodiment, the second arm **222** is pivotally connected to the support shaft **214**. Also, in one embodiment, the second arm **222** may include multiple fingers **234**. For example, in one embodiment, the second arm **222** includes two fingers **234**. In one embodiment, the number of fingers may vary. The fingers **234** are configured to wrap partially around the keel roller **212** of the boat trailer **106**.

The second arm **222** is connected to the rod **224** and is configured to pivot about the first arm **220** between a closed position and an open position when the rod **224** is pulled by a user. In the closed position, the first arm **220** and the second arm **222** are configured to secure the motor support **200** to the boat trailer **106**, specifically the keel roller **212** of the boat trailer **106**. When the second arm **222** is in the open position, the motor support **200** can be easily removed from the boat trailer **106**, for example, from the keel roller **212** of the boat trailer **106**.

In one embodiment, the latching mechanism **216** can be spring loaded similar to the embodiments **100** and **100'**. In one embodiment, the second arm **222** of the latching mechanism **216** may include a torsion spring at the pivot attachment point **236** configured to keep the second arm **222** in the closed position in a resting state. In another embodiment, the second arm **222** may be biased against the first arm **220** by way of a linear coil spring.

To attach the motor support **100** (**100'**) or **200** shown in FIGS. **1-5** to the boat trailer **106**, the user of the motor support **100**, **200** first opens the latching mechanism **116**, **216**. After opening the latching mechanism **116**, **216**, the user then couples the latching mechanism **116**, **216** to a portion of the boat trailer **106**. In one embodiment, when the user couples the latching mechanism to the boat trailer **106**, the user allows the latching mechanism **116**, **216** to close under a spring bias. In one embodiment, the user positions the latching mechanism **116**, **216** around the keel roller **112** of the boat trailer. It is contemplated that other portions of the boat trailer **106** may be used for attaching the motor support **100**. After coupling the latching mechanism **116** to the boat trailer **106**, the user then supports the boat motor **108** (shown in FIG. **1**) by positioning the motor support structure **118** against the boat motor **108**.

Even though a number of embodiments of the motor support **100** have been described as including spring-loaded latching mechanisms, other types of latching mechanisms may be used. For example, in one embodiment, the retention element **122**, **222** may be movable between the closed position and the open position by way of an electrical signal (e.g., an electric switch). The electrical signal can be transferred from a switch at the motor end **104**, to a series of wires, and then to an electrical controller. In such an embodiment, the controller may be configured to control the retention element **122**, **222**. In one embodiment, the retention element **122**, **222** may be movable by way of an electrical solenoid. Manual levers or similar mechanical mechanisms may also be used to control the retention element **122**, **222**.

In one embodiment, a method of attaching a motor support to a boat trailer further comprising pulling a rod to open the spring-loaded latching mechanism. In one embodiment, the method further comprising hooking the latching mechanism on the keel roller and allowing the latching mechanism to close under a spring bias. In one embodiment, the spring-loaded latching mechanism defines a latching arm and a latching pin, wherein the latching pin is operable against a bias of the spring. In one embodiment, the latching mechanism defines a first latch arm and a second latch arm, wherein the second latch arm is pivotable with respect to the first latch arm against a bias of the spring.

In one embodiment, the present patent application provides a motor support for a boat trailer. In one embodiment, the motor support comprises a support shaft configured to support, in a spaced-apart relationship, a motor of a boat

with respect to the boat trailer; and a trailer end and a motor end, wherein the trailer end defines a latching mechanism configured for latching the trailer end of the motor support with respect to a portion of the boat trailer, the latching mechanism having an engagement portion and a retention portion, the retention portion being movable with respect to the engagement portion. In one embodiment, the engagement portion is a latching arm and the retention portion is a latching pin.

FIGS. **6-10** provide a system **1000** for supporting the motor **108** (as shown in FIG. **1**) of the boat **110** (as shown in FIG. **1**) with respect the boat trailer **106** (as shown in FIG. **1**) in accordance with another embodiment of the present patent application. The configuration of the system **1000** is same as that of the system **100** described with respect to FIGS. **1-5**, except for some difference as noted below.

In one embodiment, the system **1000** includes a longitudinally extendable support shaft or member **1002** that is configured to be secured in a selected one of a plurality of extended positions. In one embodiment, the system **1000** includes a motor support **1004** disposed at a first end **1006** of the support shaft **1002** and a trailer connector **1032** disposed at a second end **1010** of the support shaft **1002**. In one embodiment, the trailer connector **1032** includes a releasable latch **1012** to connect the trailer connector **1032** to the boat trailer **106**. The trailer connector **1032** includes a manually enagageable actuator **1021** that is configured to selectively latch or release the trailer connector **1032** from the boat trailer **106**.

In one embodiment, the motor support **1004** includes a support member **1050** having a generally V-shaped engagement portion **1052** (as clearly seen in FIG. **8**) that is constructed and arranged to frictionally engage a portion of the motor **108** of the boat **110**. In one embodiment, the motor support **1004** also includes a pair of adjustable support members **1054**, **1056** extending from end portions of the support member **1050**. In one embodiment, the pair of adjustable support members **1054**, **1056** are constructed and arranged to frictionally engage portions of the motor **108** of the boat **110**. In one embodiment, each of the adjustable support members **1054**, **1056** and the corresponding end portions of the support member **1050** have openings that are configured to align on a same axis and to receive a lock member or pin (not shown) therein to lock each of the adjustable support members **1054**, **1056** with their corresponding end portions of the support member **1050**. In one embodiment, the pair of adjustable support members **1054**, **1056** are constructed and arranged to be pivotably adjustable with respect to their corresponding end portions of the support member **1050** and to support the portions of the motor **108** of the boat **110**.

In one embodiment, the motor support **1004** may be made of an appropriate metal (such as aluminum or steel) or other material of suitable strength. In one embodiment the motor support **1004** may be made of molded plastic material. In one embodiment, the motor support **1004** may be made of any other suitable material or combination of materials having sufficient durability to support the motor **108** of the boat **110** while maintaining structural stability of the system **1000**. In one embodiment, mechanical damping material (e.g., such as foam) may be attached to portions of the motor support **1004**.

In one embodiment, the motor support **1004** includes a connector portion **1046** extending outwardly therefrom. In one embodiment, the connector portion **1046** is constructed and arranged to be received by the end **1006** of the support shaft **1002**. In one embodiment, the end **1006** of the support shaft **1002** has an opening to receive the connector portion **1046** therein. In one embodiment, the connector portion **1046** of the motor support **1004** and the end **1006** of the support shaft **1002** each have corresponding openings that are configured to align on a same axis and to receive a lock member or pin (not shown) therein to lock the motor support **1004** with the support shaft **1002**. In one embodiment, the lock pin is a releasable lock pin configured to releasably lock the motor support **1004** with the support shaft **1002**. In one embodiment, the releasable locking arrangement between the motor support **1004** and the support shaft **1002** allows the user to use the same support shaft with different sized motor supports and/or with motor supports having different configurations. In one embodiment, the releasable locking arrangement between the motor support **1004** and the support shaft **1002** allows the user to replace just the motor support **1004** when it is worn out or damaged. In another embodiment, the motor support **1004** may be integrally formed with a first support member **1016** of the shaft member **1002**. For example, in one embodiment, the motor support **1004** may be integrally formed at the end **1006** of the first support member **1016** of the shaft member **1002**.

In one embodiment, the longitudinally extendable support shaft **1002** of the system **1000** includes the first support member **1016** that is constructed and arranged to support the motor **108** of the boat **110** and a second support member **1018** that is constructed and arranged to be releasably secured to a portion (e.g., keel roller **112** as shown in FIG. **1**) of the boat trailer **106**.

In one embodiment, the first and second support members **1016** and **1018** may be made of an appropriate metal (such as aluminum or steel) or other material of suitable strength. In one embodiment, the first and second support members **1016** and **1018** may be made of molded plastic material. In one embodiment, the first and second support members **1016** and **1018** may be made of any other suitable material or combination of materials having sufficient durability to support the motor **108** of the boat **110** (as shown in FIG. **1**) with respect the boat trailer **106** while maintaining structural stability of the system **1000**. In one embodiment, the first and second support members **1016** and **1018** may be made by an extrusion procedure.

In one embodiment, the first support member **1016** may be also referred to as the motor end support member. In one embodiment, the first support member **1016** includes the end **1006** and an opposing end (not shown). In one embodiment, the first support member **1016** is constructed and arranged to support the motor **108** of the boat **110** at the end **1006**.

In one embodiment, the first support member **1016** is generally hollow and has a generally circular cross-sectional configuration. In another embodiment, the first support member **1016** is generally solid and has a generally circular cross-sectional configuration. In yet another embodiment, the first support member **1016** may have other cross-sectional configurations.

In one embodiment, the first support member **1016** may include a stop member **1028** generally extending along (the longitudinal axis L-L of the support member **1002**) a portion or the entire length of the first support member **1016** and generally extending outwardly from an outer or external surface **1029** of the first support member **1016**. In one embodiment, the stop member **1028** is in the form of a protrusion. In one embodiment, the stop member **1028** is constructed and arranged to be received by a stop member receiving portion **1030** of the second support member **1018** so as to prevent any relative rotation between the first support member **1016** and the second support member **1018**.

In the illustrative embodiment, one stop member is shown. In one embodiment, the number of stop members may vary. For example, such stop members may be positioned circumferentially around the first support member **1016**.

In one embodiment, the first support member **1016** includes a plurality of lock components or lock engaging structures **1026***b* to lock the first support member **1016** with the second support member **1018**. In one embodiment, the lock engaging structures **1026***b* are in the form of holes, grooves, openings or notches to engage with a lock member **1024** of a lock assembly **1020** as will be described in detail below.

In one embodiment, the lock components or lock engaging structures **1026***b* are positioned on about one half of the length of the first support member **1016** that is closer to the end **1006**. In one embodiment, the lock components or lock engaging structures **1026***b* are positioned on about one third of the length of the first support member **1016** that is closer to the end **1006**. In one embodiment, the lock components or lock engaging structures **1026***b* are positioned on about one fourth of the length of the first support member **1016** that is closer to the end **1006**. In one embodiment, the lock components or lock engaging structures **1026***b* are positioned on about two thirds of the length of the first support member **1016** that is closer to the end **1006**.

In one embodiment, the second support member **1018** may be referred to as the boat trailer end support member. In one embodiment, the second support member **1018** includes the end **1010** and an opposing end (not shown). In one embodiment, the second support member **1018** is constructed and arranged to be releasably secured to a portion (e.g., keel roller **112** as shown in FIG. **1**) of the boat trailer **106** at the end **1010**.

In one embodiment, the second support member **1018** is generally hollow and has a generally circular cross-sectional configuration. In another embodiment, the second support member **1018** may have other cross-sectional configurations. In one embodiment, the second support member **1018** includes the stop member receiving portion **1030** generally extending along (the longitudinal axis L-L of the support member **1002**) a portion or the entire length of the second support member **1018**. In one embodiment, the stop member receiving portion **1030** is in the form of a groove. In one embodiment, the stop member receiving portion **1030** is an inwardly facing groove extending outwardly from the second support member **1018**.

In one embodiment, the stop member receiving portion **1030** is constructed and arranged to receive the stop member **1028** of the first support member **1016** therein so as to prevent any relative rotation between the first support member **1016** and the second support member **1018**. In the illustrative embodiment, one stop member receiving portion **1030** is shown. In another embodiment, the number of stop member receiving portions may vary. For example, such stop members may be positioned circumferentially around the second support member **1018** and configured to receive their corresponding stop members.

In another embodiment, the stop member receiving portion may be positioned on the first support member **1016** and is configured to receive the corresponding stop member positioned on the second support member **1018** so as to prevent any relative rotation between the first support member **1016** and the second support member **1018**. It is contemplated that the stop member receiving portion and the corresponding stop member may have other shapes, sizes and configurations as would be appreciated by one skilled in the art as long as they to prevent any relative rotation between the first support member **1016** and the second support member **1018**.

In one embodiment, the second support member **1018** includes a lock component or lock engaging structure **1026***a* that is constructed and arranged to align with one of the lock engaging structures **1026***b* of the first support member **1016** to accommodate and to allow the lock member **1024** of the lock assembly **1020** to be inserted into one of the lock engaging structures **1026***b* of the first support member **1016**, when the first support member **1016** is in the predetermined or desired longitudinally extended position with the second support member **1018**.

In one embodiment, the first support member **1016** is constructed and arranged to be received by and extending in and out of the second support member **1018** to facilitate longitudinal telescopic movement between the first and second support members **1016** and **1018**.

In one embodiment, the system **1000** includes the lock assembly **1020** that is constructed and arranged to selectively lock the first and second support members **1016** and **1018** at one of a plurality of longitudinally extended positions. That is, in one embodiment, the lock assembly **1020** is configured to lock the first support member **1016** and the second support member **1018** at a predetermined or desired longitudinally extended position. In one embodiment, the lock assembly **1020** includes the lock member **1024** that is movable between a first position and a second position. The lock member **1024** is linked to the lock components **1026** (e.g., **1026***a*, **1026***b*) associated with the first and second support members **1016** and **1018** so that the movement of the lock member **1024** from the first position to the second position unlocks the lock assembly **1020** to enable the longitudinal telescopic movement between first and second support members **1016** and **1018**.

In one embodiment, the first support member **1016** is configured to be moved and adjusted longitudinally along the longitudinal axis L-L of the support member **1002** and with respect to the second support member **1018** in the plurality of longitudinally extended positions as desired by the user.

In one embodiment, the lock assembly **1020** includes a bias member. In one embodiment, the bias member is a spring. In one embodiment, the bias member of the lock assembly **1020** is constructed and arranged to be positioned between a manually engageable member **1021** (its structure and operation are described in detail below) and an outer or exterior surface **1031** of the second support member **1018**. In one embodiment, the lock member **1024** is held inserted in one of the plurality of lock engaging structures **1026***b* of the first support member **1016** by the bias member. Thus, the bias member is constructed and arranged to lock the lock assembly **1020** at a selected position and to prevent relative movement of the first and second support members **1016** and **1018**.

The operation of the lock assembly **1020** as described below. In one embodiment, the lock member **1024** is pulled against the force of the bias member, thus, the lock member **1024** is moved outwardly away from the lock engaging structure **1026***b* of the first support member **1016** unlocking the lock assembly **1020**. Once the lock member **1024** is withdrawn from the lock engaging structure **1026***b* of the first support member **1016**, the first and second support members **1016** and **1018** are extended slightly so that the lock engaging structure **1026***b* of the first support member **1016** no longer aligns with the lock engaging structure **1026***a* of the second support member **1018**, the force of bias

member will cause the lock member **1024** to engage with the outer or exterior surface **1031** of the second support member **1018** and slide along this surface until the lock member **1024** becomes aligned with another or second lock engaging structure **1026***b* of the first support member **1016**. At this point, the bias of the bias member forces the lock member **1024** into the second lock engaging structure **1026***b* of the first support member **1016** to lock the lock member **1024** at this selected longitudinally extended position.

In another embodiment, the lock assembly **1020** may be in the form of an adjustment knob. For example, in one embodiment, the adjustment knob is turned to loosen the knob. The adjustment knob is then pulled to release its lock member **1024** from one of the plurality of lock engaging structures **1026***b* of the first support member **1016**. In one embodiment, the first support member **1016** and the second support member **1018** are then slid until the support shaft **1002** is at the user desired length. The adjustment knob is then released such that its lock member **1024** engages with the other of the plurality of lock engaging structures **1026** of the first support member **1016**. After adjusting the support shaft **1002** to the desired position and locking the support shaft or member **1002** at the desired length (by engaging its lock member **1024** with one of the plurality of lock engaging structures **1026***b* of the first support member **1016**), the adjustment knob is tightened by the user.

In one embodiment, the system **1000** may include a stop to guide the lock member **1024** to be inserted into one of the lock engaging structures **1026***b* of the first support member **1016** and to prevent the lock member **1024** from traveling past the lock engaging structures **1026***b* of the first support member **1016**. In another embodiment, the stop is optional.

In one embodiment, the system **1000** includes generally inverted U-shaped member **1032**. In one embodiment, the inverted U-shaped member **1032** may also be referred to as the trailer connector. In one embodiment, the inverted U-shaped member **1032** is constructed and arranged to receive the portion **112** of the boat trailer **106** within the generally U-shaped configuration. In one embodiment, the inverted U-shaped member **1032** is positioned on the end **1010** of the support shaft **1002** or the second support shaft **1018**.

In one embodiment, the U-shaped member **1032** has a bight portion **1034** and a pair of leg members **1036** extending downwardly from the sides **1038** and **1040** of the bight portion **1032**. In one embodiment, the leg members **1038**, **1040** are generally perpendicular to the longitudinal axis L-L of the support member **1002**. In one embodiment, the support shaft **1002** is constructed and arranged to be connected to one of the pair of leg members **1038**, **1040** of the U-shaped member **1032**.

In one embodiment, the inverted U-shaped member **1032** includes a connector portion **1042** (as shown in FIG. **7**) extending outwardly from one of the leg members **1038**, **1040**. In one embodiment, the connector portion **1042** is constructed and arranged to be received by the end portion **1010** of the second shaft member **1018**. In one embodiment, the end portion **1010** of the second shaft member **1018** has an opening to receive the connector portion **1042** therein. In one embodiment, the connector portion **1042** of the inverted U-shaped member **1032** and the end portion **1010** of the second shaft member **1018** each have corresponding openings that are configured to align on a same axis and to receive a lock pin **1044** therein to lock the inverted U-shaped member **1032** with the second shaft member **1018**. In one embodiment, the lock pin **1044** is a releasable lock pin configured to releasably lock the inverted U-shaped member **1032** with the second shaft member **1018**. In one embodiment, the releasable locking arrangement between the inverted U-shaped member **1032** and the second shaft member **1018** of the support shaft **1002** allows the user to use the same support shaft with different sized inverted U-shaped members and/or inverted U-shaped members with different configurations. In one embodiment, the releasable locking arrangement between the inverted U-shaped member **1032** and the second shaft member **1018** of the support shaft **1002** allows the user to replace just the inverted U-shaped member **1032** when it is worn out or damaged. In another embodiment, the inverted U-shaped member **1032** may be integrally formed with the second support member **1018** of the shaft member **1002**. In one embodiment, the inverted U-shaped member **1032** may be integrally formed at the end **1010** of the second support member **1018** of the shaft member **1002**.

In one embodiment, the system **1000** includes a releasable latch assembly **1048** that is constructed and arranged to releasably secure the inverted U-shaped member **1032** to the portion **112** of the boat trailer **106**. In one embodiment, the latch assembly **1048** includes the latch member **1012** moveable between a latched position and a released (or unlatched) position. In the latched position, the latch member **1012** is constructed and arranged to retain the portion **112** of the boat trailer **106** within the generally U-shaped configuration of the inverted U-shaped member **1032**. That is, in one embodiment, the latch member **1012** is constructed and arranged to connect the trailer connector **1032** to the boat trailer **106**. In one embodiment, the latch member **1012** is constructed and arranged to be movable in the direction of the longitudinal axis L-L of the support member **1002** between the latched position and the released position. In another embodiment, the latch member **1012** is constructed and arranged to be pivotable between the latched position and the released position. In one embodiment, the latch assembly **1048** includes a bias member **1097** (as shown in FIG. **7**) constructed and arranged to bias the latch member **1012** toward the latched position. In one embodiment, the bias member **1097** is a spring.

In one embodiment, the construction, components and operation of the latch assembly **1048** is similar to the latching mechanism **116** as described in detail with respect to FIGS. **2-4** of the present patent application. For example, the latch assembly **1048** may include a release rod **1087** (e.g., similar to the rod **124** as shown in FIGS. **1-4** and rod **224** as shown in FIG. **5**), the bias member **1097** (e.g., similar to the spring **132**), the latch member **1012** (e.g., similar to the retention element **122** or **222**), and a latch housing **1085** (e.g., similar to the latching cylinder **128** as shown in FIGS. **1-4**). Differences between the latch assembly **1048** and the latching mechanism **116** are noted below.

In one embodiment, the system **1000** includes the manually engageable member **1021** that is configured to selectively latch or release the trailer connector **1032** from the boat trailer **106**. In one embodiment, the manually engageable actuator **1021** is constructed and arranged to be moved to effect movement of the latch member **1012** between the latched position and the released position.

In one embodiment, the manually engageable member **1021** is constructed and arranged to slidably positioned on the second support member **1018**. In one embodiment, the manually engageable member **1021** is constructed and arranged to receive the second support member **1018** therein. In one embodiment, the manually engageable member **1021** includes a groove constructed and arranged to receive the stop member receiving portion **1030** of the

second support member **1018** so as to prevent any relative rotation between the manually engageable member **1021** and the second support member **1018**. In one embodiment, the manually engageable member **1021** may be made of an appropriate metal (such as aluminum or steel) or other material of suitable strength.

In one embodiment, the manually engageable member **1021** includes an elongated opening **1025**. In one embodiment, the elongated opening **1025** is constructed and arranged to receive the lock member **1024** of the lock assembly **1020** therein. In one embodiment, a portion of the lock member **1024** extends through the elongated opening **1025** such that the manually engageable member **1021** is able to slidably move on the second support member **1018** to selectively latch or release the trailer connector **1032** from the boat trailer **106**. That is, the manually engageable member **1021** is constructed and arranged to travel over the lock member **1024** of the lock assembly **1020**. In one embodiment, the elongated opening **1025** includes a first end portion **1091** and a second end portion **1093**.

In one embodiment, the release rod **1087** is connected to a portion of the manually engageable member **1021** such that the slidable movement of the manually engageable member **1021** on the second support member **1018** causes the release rod **1087** to move along with the manually engageable member **1021**.

The operation of the manually engageable member **1021** is described in detail below. When the first support member **1016** and the second support member **1018** are locked at a predetermined or desired longitudinally extended position by the lock assembly **1020**, the lock member **1024** of the lock assembly **1020** is positioned at the first end portion **1091** of the elongated opening **1025**. FIG. **9** shows the manually engageable member **1021** in its first position LP in which the lock member **1024** is at the first end portion **1091** of the elongated opening **1025**.

The manually engageable member **1021** is then manually actuated by a user to move the lock member **1012** from its latched position to its release position. In one embodiment, the user may manually slide the manually engageable member **1021** on the second support member **1018** in a direction of the arrow R (as shown in FIG. **9**) and towards the end **1006** of the support shaft **1002** to effect movement of the latch member **1012** from its latched position and its released position. FIG. **9** shows the manually engageable member **1021** in its second position RP in which the lock member **1024** is at the second end portion **1093** of the elongated opening **1025**.

The operation and interaction of the release rod **1087**, the bias member **1097**, the latch member **1012** of the latch assembly **1048** are similar to those described with respect to FIGS. **1-5**, and hence will not be described in detail here. For example, in one embodiment, pulling back or sliding the manually engageable member **1021** (from its first position LP to second position RP) on the second support member **1018** pulls the release rod **1087** along with it. This movement of the release rod **1087** causes the latch member **1012** (i.e., operatively connected to the release rod **1087**) to be moved from its latched position to its released position as described in detail with respect to FIGS.**1-5**. Once the latch member **1012** is moved to its released position, the trailer connector **1034** can slide over the keel roller **112** of the boat trailer **106**.

When the user releases the manually engageable member **1021**, the bias member **1097** causes the release rod **1087** and the manually engageable member **1021** operatively connected to the release rod **1087** to return to their original positions. For example, the bias of the bias member **1097**causes the manually engageable member **1021** to return to its original position LP. Also, as explained in detail with respect to FIGS. **1-5**, the bias of the bias member **1097** causes the release rod **1087** and the latch member **1021** operatively connected to the release rod **1087** to return to their original/latched positions.

In one embodiment, the second support member **1018** includes a notch **1019** (as shown in FIG. **10**) that is constructed and arranged to receive the release rod **1087** of the latch assembly **1048** therein. In one embodiment, the notch **1019** is formed by an extrusion procedure on the outer surface **1031** of the second support member **1018**. In one embodiment, the notch **1019** is an outwardly facing groove extending inwardly from the outer surface **1031** of the second support member **1018**. In one embodiment, the notch **1019** generally extends along (the longitudinal axis L-L of the support member **1002**) a portion or the entire length of the second support member **1018**.

In one embodiment, the second support member **1018** includes a cover member **1089** that is configured to cover or contain the release rod **1087** positioned in the notch **1019**. In one embodiment, the cover member **1089** may be integrally formed with the second support member **1018**.

Although the present patent application has been described in detail for the purpose of illustration, it is to be understood that such detail is solely for that purpose and that the present patent application is not limited to the disclosed embodiments, but, on the contrary, is intended to cover modifications and equivalent arrangements that are within the spirit and scope of the appended claims. In addition, it is to be understood that the present patent application contemplates that, to the extent possible, one or more features of any embodiment can be combined with one or more features of any other embodiment.

What is claimed is:

1. A motor support for a boat trailer comprising:

a support shaft configured to support, in a spaced-apart relationship, a motor of a boat with respect to the boat trailer;

a trailer end comprising a trailer connector, the trailer connector configured to connect to a portion of the boat trailer; and

a motor end configured to engage with the motor of the boat,

wherein the trailer end defines a spring-loaded latch mechanism configured to releasably secure the trailer connector of the motor support with respect to the portion of the boat trailer, and

the spring-loaded latch mechanism being movable between (a) a latch position to secure the portion of the boat trailer to the trailer connector and (b) a release position to release the trailer connector from the portion of the boat trailer so as to enable removal of the trailer connector from the portion of the boat trailer.

2. The motor support of claim **1**, wherein the latch mechanism comprises a spring and defines a pull handle operable against a bias of the spring for releasing the trailer connector of the motor support from the boat trailer.

3. The motor support of claim **1**, wherein the latch mechanism comprises a spring and defines a latch pin, and wherein the latch pin is operable against a bias of the spring.

4. The motor support of claim **3**, wherein the support shaft has a longitudinal axis, and wherein the latch pin is movable in a direction parallel to the longitudinal axis.

5. The motor support of claim **1**, wherein the trailer connector is a hook.

6. A motor support for a boat trailer comprising:

a support shaft configured to support, in a spaced-apart relationship, a motor of a boat with respect to the boat trailer;

a trailer end, wherein the trailer end comprises a trailer connector configured to connect to a portion of the boat trailer and defines a spring-loaded latch mechanism configured to releasably secure the trailer connector of the motor support with respect to the portion of the boat trailer,

wherein the latch mechanism comprises a spring and defines a pull handle operable against a bias of the spring to releasably secure the trailer connector of the motor support with respect to the portion of the boat trailer;

the spring-loaded latch mechanism being movable between (a) a latch position to secure the boat trailer to the trailer connector and (b) a release position to release the trailer connector from the portion of the boat trailer so as to enable removal of the trailer connector from the portion of the boat trailer; and

a motor end, wherein the motor end includes a motor support structure configured to rest against a portion of the motor of the boat.

7. The motor support of claim 6, wherein the portion of the boat trailer includes a keel roller of the boat trailer.

8. The motor support of claim 6, wherein the latch mechanism includes a latch pin, and wherein the latch pin is attached to the pull handle.

9. The motor support of claim 1, wherein the trailer connector is configured to be positioned around the portion of the boat trailer.

10. The motor support of claim 1, wherein the trailer connector includes a generally inverted U-shaped member constructed and arranged to receive the portion of the boat trailer within the generally U-shaped configuration, wherein the inverted U-shaped member includes a bight portion and a pair of leg members extending downwardly from the sides of the bight portion, and wherein the support shaft is constructed and arranged to be connected to one of the pair of leg members of the inverted U-shaped member.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 10,549,674 B2
APPLICATION NO. : 15/094964
DATED : February 4, 2020
INVENTOR(S) : Rick Huddleston

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the Title Page

Item (73) Assignee:
Replace "WHITE RIVER MARINE GROUP, LLC, Springfield, MN (US)"
With -- WHITE RIVER MARINE GROUP, LLC, Springfield, MO (US) --

Signed and Sealed this
Fourteenth Day of April, 2020

Andrei Iancu
Director of the United States Patent and Trademark Office